

(12) UK Patent Application (19) GB (11) 2 038 597 A

(21) Application No 7915896

(22) Date of filing
8 May 1979

(30) Priority data

(31) 53/176347U

(32) 21 Dec 1978

(33) Japan (JP)

(43) Application published
23 Jul 1980

(51) INT CL³ A63F 9/22

(52) Domestic classification
H4T 4R BRA
A6M 8X

(56) Documents cited
GB 2004444A
GB 2000946A
GB 1472480
GB 1460003
GB 1389861
GB 1318057
GB 1268821
US 4095791A

(58) Field of search
A6D
A6M
H4T

(71) Applicant

Nintendo Co Ltd
60 Kamitakamatsu-cho
Fukuine

Higashiyama-ku

Kyoto City

Japan

(72) Inventor

Masayuki Uemura

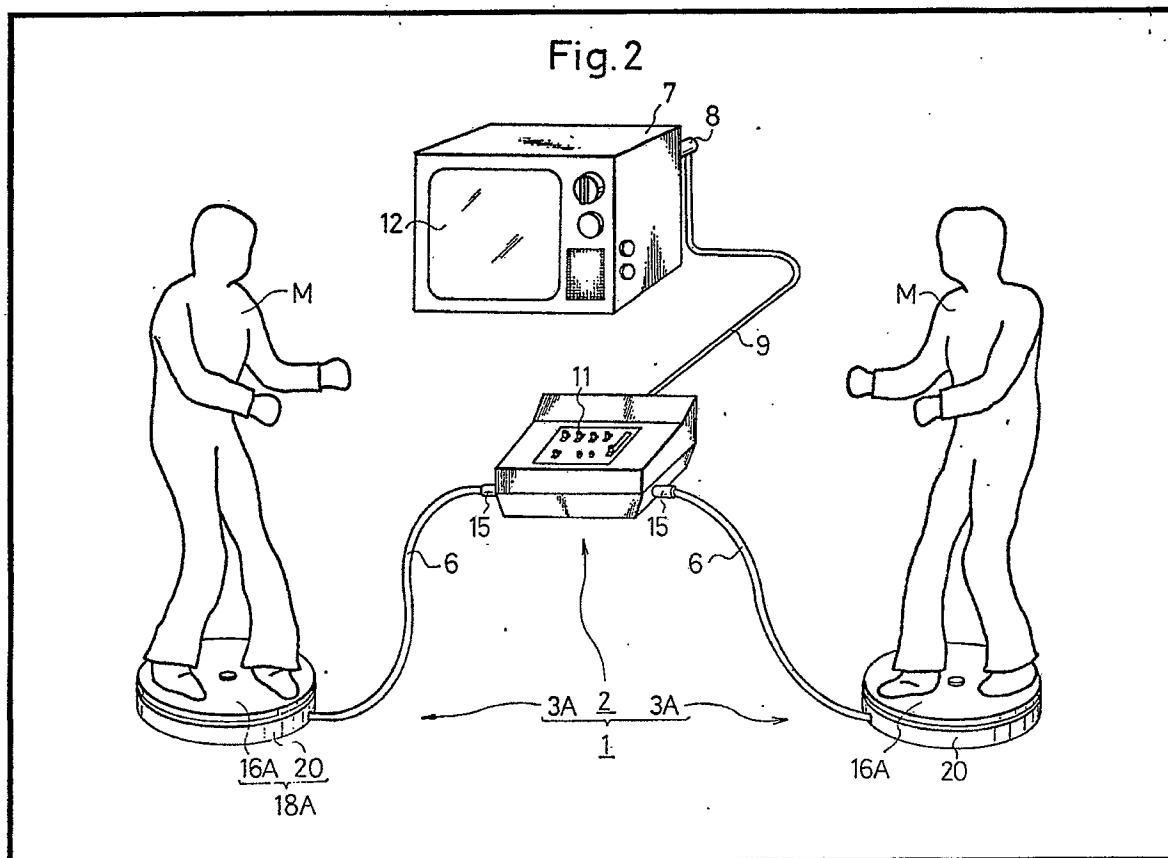
(74) Agents

Stevens Hewlett &
Perkins

(54) TV Game Apparatus

(57) A television game apparatus including a lead 6 to be connected to a control unit 3A which is manipulated by a player M and a game signal lead 9 to be connected to an antenna terminal 8 of a TV receiver 7, whereby a game is carried out by players who change the display on the TV screen by manipulating their respective control unit 3A. The

control unit 3A is a movement detecting system and includes a movable element which moves according to movement of a player and an electric control element (not shown) which varies an electric parameter, for example resistance, according to the positional change of the movable element. Variations of the electric parameter cause the positional changes of moving signals on the TV screen and thus enable a variety of games to be played by utilizing a television set.



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Fig.1

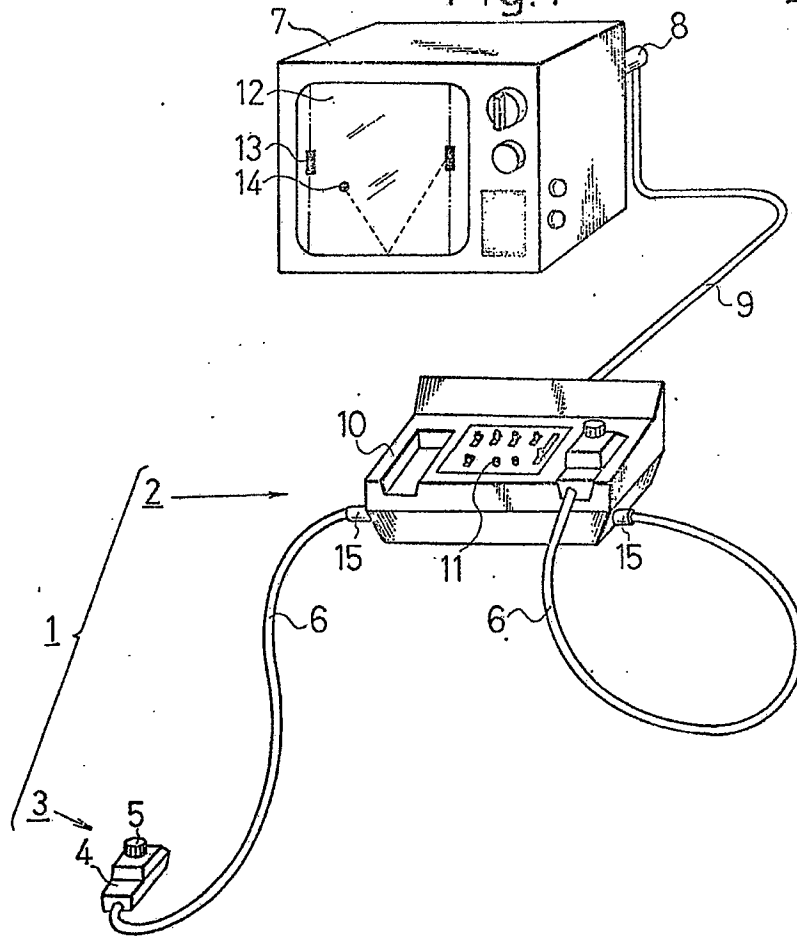


Fig.6

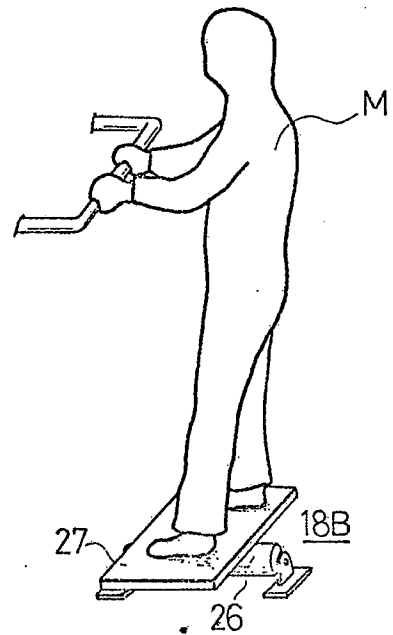


Fig.7

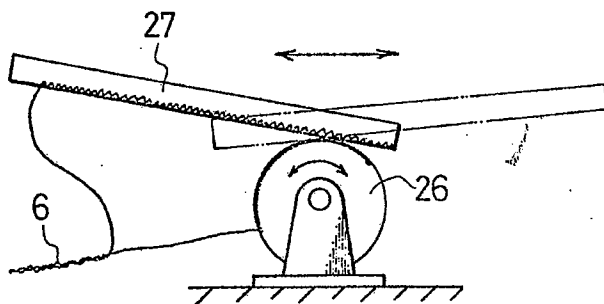
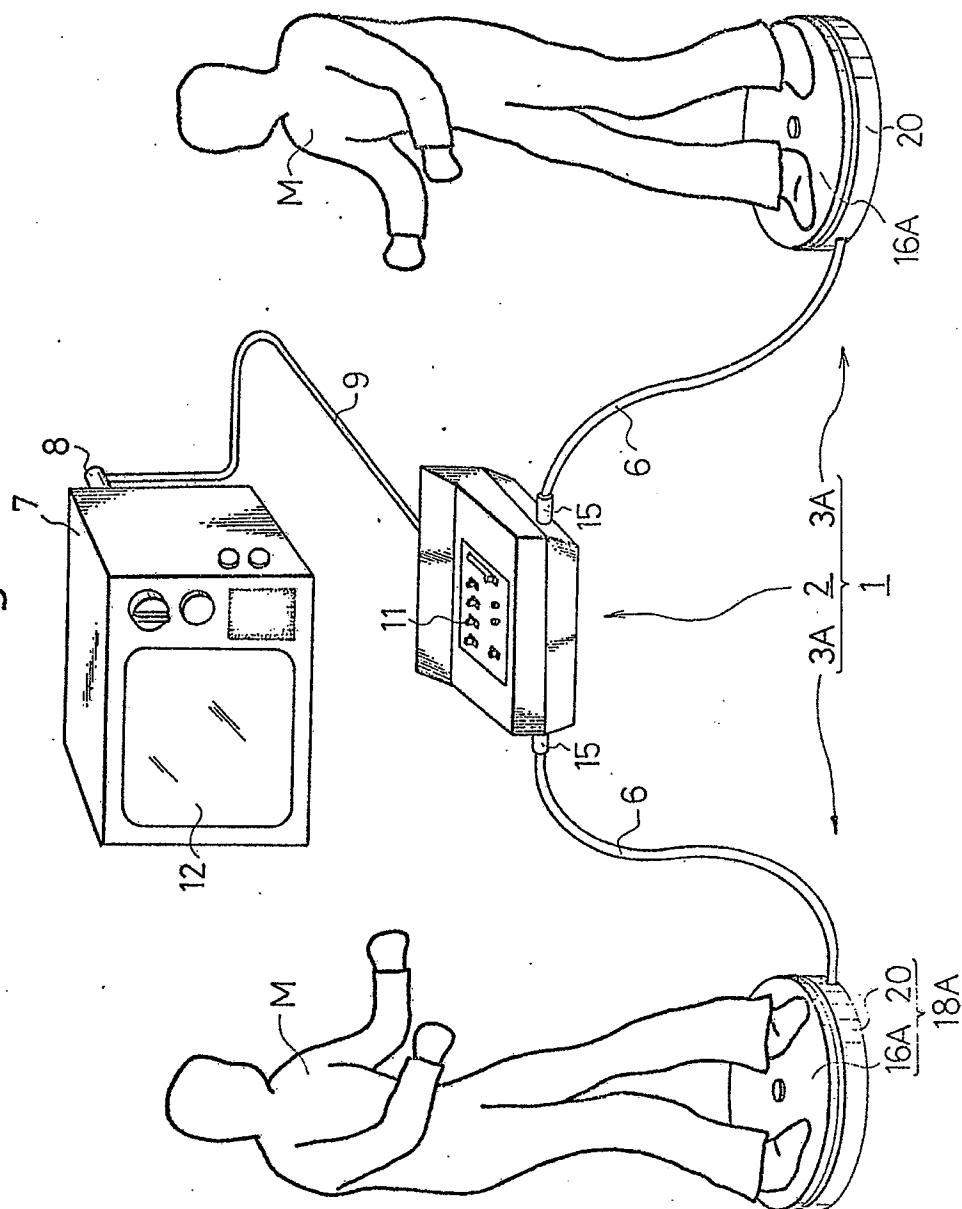


Fig. 2



POOR QUALITY

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Fig.3

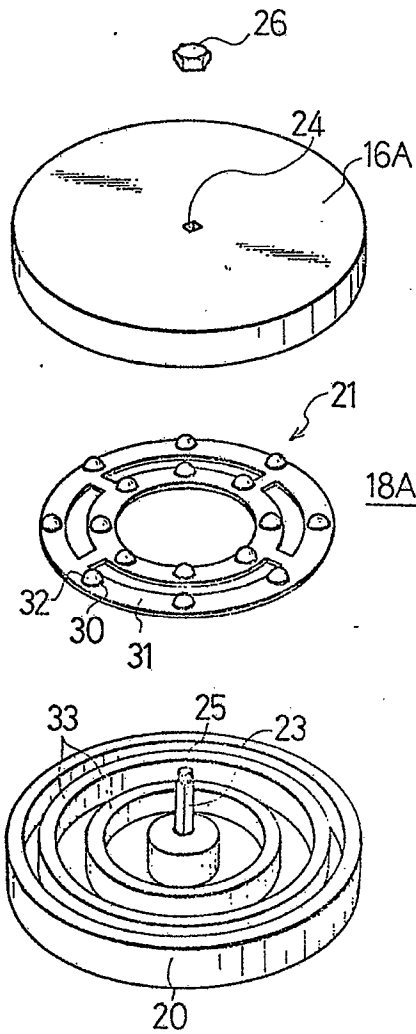


Fig.4

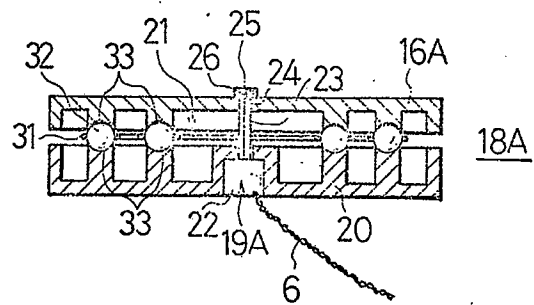


Fig.5

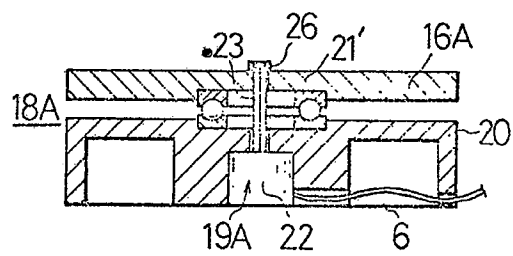


Fig.8

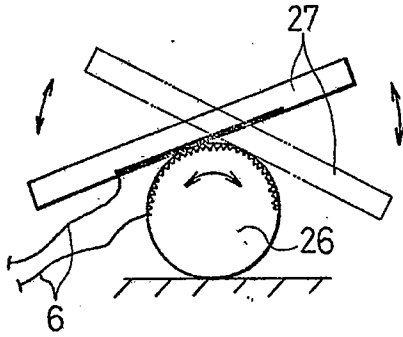


Fig.9

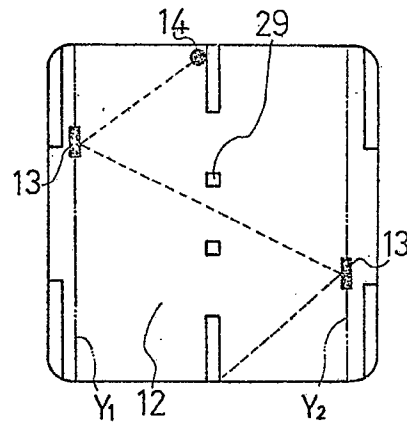


Fig.10

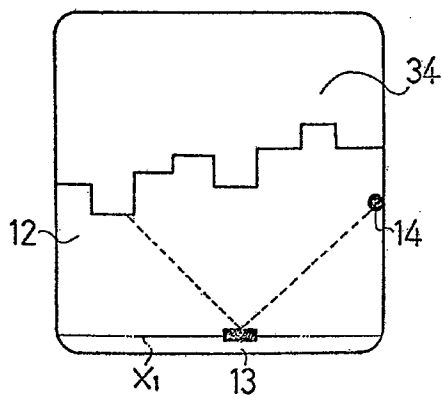
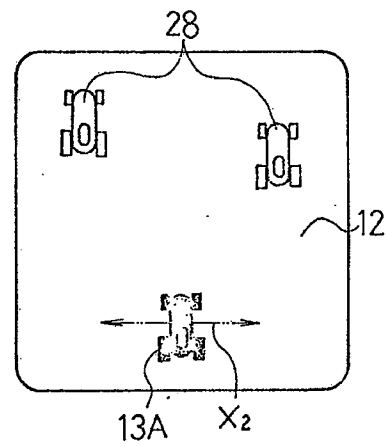


Fig.11



SPECIFICATION

TV gaming apparatus

5 This invention relates to a gaming apparatus which utilizes television display. More particularly, this invention relates to a television gaming apparatus whereby a variety of games can be played by changing the display on a TV screen (display of symbols on a Braun tube) through the manipulation of a control unit by a player.

TV gaming apparatus is already known by U.S. Patent No. 3,659,284 and U.S. Patent No. 3,659,285. Such TV gaming apparatus includes first means to generate electric signals for displaying a first symbol (for example, the ball of a pingpong game) on the TV screen, second means to generate electric signals for displaying a second symbol (for example, the net of a ping-pong game) at a predetermined position on the TV screen, means for ascertaining coincidence between said first symbol (the ball) and second symbol (the net) and for changing the movement of said first symbol (the ball) upon such coincidence, third means to generate electric signals for displaying a third symbol (for example, the racket of a ping-pong game) on the TV screen, control means which is capable of changing said electric signals for displaying a third symbol in order to move said third symbol (the racket) on the TV screen, and means for ascertaining coincidence between said third symbol (the racket) and said first symbol (the ball) and to impart a distinct motion to said first symbol (the ball) upon such coincidence. The above-mentioned control means, for example, is so designed that a player changes the voltage amplitude of the electric signals for displaying the third symbol (the racket) by changing the electric resistance by manipulating a variable resistor provided in a control box, whereby the third symbol (the racket) is moved on the TV screen in a horizontal direction or in a vertical direction and thus a ping-pong game is carried out.

In the above-mentioned TV gaming apparatus, however, players manipulate the knob of a control box using their fingers and therefore they move their body only slightly during a game. Thus, TV games can become rather monotonous and players' interest gradually diminishes.

55 This invention seeks to improve the control unit in TV gaming apparatus, more particularly, to control the movement of moving symbols (for example, rackets) on the TV screen by players who use an exercise equipment.

In accordance with the invention, there is provided television gaming apparatus comprising output means for connection to the antenna terminal of a television receiver via a game signal lead for displaying the progress

of a game in response to the motion of a player on the screen of the television receiver, a control unit having a movable element which moves in response to the motion of a player, and an electroc control element operable to vary an electric parameter in response to the positional change of said movable element, and a control lead having a pair of conductors connected to said electric control element, whereby the progress of a game to be displayed on the screen of the television receiver is varied according to the motion of a player.

In order that the invention may be better understood, several embodiments thereof will not be described by way of example only and with reference to the accompanying drawings in which:—

Figure 1 is a perspective view showing an example of a known TV gaming apparatus;

Figure 2 is a perspective view of an example of a TV gaming apparatus according to the present invention in use;

Figure 3 is an exploded perspective view of a twist turntable or an exercise equipment;

Figure 4 is a cross section of the twist turntable shown in Fig. 3;

Figure 5 is a cross section of another embodiment of the twist turntable;

Figure 6 is a perspective view of another embodiment of an exercise equipment;

Figure 7 is a rough sketch showing the main part of the exercise equipment shown in Fig. 6;

Figure 8 is a rough sketch showing the main part of the exercise equipment shown in Fig. 6, executing different movements, and

Figure 9 to Figure 11 are rough sketches showing symbols displayed on the TV screen, of which Fig. 9 is for a simulated tennis game, Fig. 10 is for a "block breaking" game and Fig. 11 is for a drive game.

Referring now to Figs. 1 and 2, the TV gaming apparatus shown under reference 1 comprises a TV game control unit 2 to be connected to a general TV set 7 for home use and a control unit 3 to be connected to said TV game control unit 2.

In conventional TV gaming apparatus 1 such as shown in Fig. 1, the control unit 3 comprises a control box 4 which has therein a variable resistor and is connected to the TV game control unit 2 through the medium of a lead 6. A shaft of the variable resistor partly projects above the upper surface of the control box 4 and a knob 5 for turning said shaft is fixed thereto. Thus, the electric resistance of the variable resistor can be varied by turning the knob 5.

The control unit 2 is connected to the TV set 7 via a lead 9 which is detachably connected to an input antenna terminal 8 of the TV set 7. By manipulating a selection button 11 of a control box 10 a desired game out of a variety of games including a simulated ping-

pong game and a simulated volley ball game may be selected, whereupon symbols of moving stoppers 13 (such as rackets) and symbols of a moving object 14 (such as a ball) are displayed on the TV screen. Electronic circuits are arranged to adjust signals to move the stoppers 13 on the TV screen by manipulating the knob 5 of the control unit 3.

The lead 6 is detachably connected to a connector 15, such as a terminal or a socket, which is provided at the side of the control box 10. Thus, the control unit 3 is detachable from the control box 10.

In the first described embodiment of the invention, shown in Figs. 2, 3 and 4, the control unit of the movement detecting system 3A corresponds to the control units 3 of the conventional TV gaming apparatus shown in Fig. 1. This control unit 3A includes a movable element which moves in response to the movement of a player and an electric control element which varies an electric parameter in response to the movement of said movable element.

The movable element takes the form of a turntable 16A of a twist disc device 18A for swing twist exercise (a kind of health sporting activity for training feet, waist, etc. often carried on by white collar workers), and the electric control element is represented by a variable resistor 19A (Fig. 4). The twist disc device 18A comprises a base plate 20, the turntable 16A in the shape of a disc mounted on said base plate 20, and a turn ball plate 21 interposed between the turntable 16A and the base plate 20 to make the turntable 16A rotatable in relation to the base plate 20. In an alternative embodiment, shown in Fig. 5, the turn ball plate 21 is replaced by a ball bearing 21'.

Referring to Figs. 3 and 4, the turn ball plate 21 comprises a synthetic resin plate 31 with a plurality of holes 30 arranged on two concentric circles. Balls 32 are put in said holes 30 and annular grooves 33 whose cross section is semicircular are made in the upper surface of the base plate 20 and the under surface of the turntable 16A, as shown clearly in Fig. 4. With this arrangement, the turn ball plate 21 is movable in circumferential direction as it is guided by the annular grooves 33 and balls 32. Thus, the turn ball plate 21 is rotatable in relation to the base plate 20 and the turntable 16A.

The casing 22 of the variable resistor 19A is fixed at the centre of the base plate 20 and a shaft 23 of square cross section projects from the upper surface of the casing 22 and is fitted in a square hole 24 which is made through the centre of the turntable 16A. A nut 26 is screwed onto a threaded portion 25 at an end portion of the shaft 23 to fix the turntable 16A and the shaft 23 together in such a way that the shaft 23 is turned with rotation of the turntable 16A. In a similar

manner to rotation of the knob 5 fixed to the shaft of the variable resistor shown in Fig. 1, the electric resistance of the variable resistor 19A is varied by rotation of the turntable 16A caused by the swing twist motion of a player M (Fig. 2). The lead 6 comprises two lead wires from the variable resistor 19A and the electric control value (electric resistance) between two wires at the terminals 15 of the control box 10 to which the leads 6 are connected is made variable.

In the above-described embodiment a variable resistor is used as an electric control element for varying electric resistance. However, it will be clear that the variable resistor can be substituted by a variable capacitor, a variable inductor, a variable transformer or the like. Alternatively, an electromotive element such as a piezo-electric element may be used as an electric control element and the electromotive voltage may be used as an electric parameter. In short, the necessary control function can be achieved by making the impedance between the two wires entering the terminal 15 variable.

The movable object is not confined to the turntable 16A for swing twist exercise as shown in Figs. 3 and 4 but various types of exercise equipment (for the use of white collar workers who are in general rather under-exercised) can be used. For example exercise equipment for pulling by hand, exercise equipment for pulling by the whole body, exercise equipment for pushing out by hands and legs may all be used. In Fig. 6, there is shown a balancing device 18B balanced on a tubular body 26 which is so designed that the electric resistance between the wires of control lead 6 may be varied by lateral motion, as illustrated diagrammatically in Fig. 7 or by seesaw motion as illustrated diagrammatically in Fig. 8. In short any movable element (turntable, sliding plate, etc.) whose position may be varied according to a player's motion (moving of hands, feet, etc.) and which is operable to the value of an electric control element (electric resistance, capacity, inductance, mutual inductance, transformation ratio, etc.) in response to the positional change of said movable element, may be used.

In carrying out a game using the apparatus described above, for example a simulated tennis game such as shown in Fig. 9, "tennis racket" symbols 13 on a TV screen are moved up and down as shown by two-dot chain lines Y_1 , Y_2 to repel a "ball" symbol 14. In this case, the "racket" is made the moving indicator to be operated by the player. In the case of a "block breaking" game as shown in Figure 10, a "racket" symbol 13 is moved in lateral direction as shown by a two-dot chain line X_1 to hit a "ball" symbol against a "block" above and break it. In this case, the "racket" is made the moving indicator to be operated by the player.

In the case of a "drive" game as shown in Fig. 11, obstacles 28 (a car running ahead and a car running in the opposite direction) are displayed at the upper part of the TV screen and a player tries to make a "driving car" symbol 13A pass through between obstacles 28 by moving the symbol 13A in lateral direction as shown by a two-dot chain line X₂. In this case, the "driving car" symbol 13A is made the moving indicator to be operated by the player.

In the above embodiment, similarly to the known TV game apparatus the apparatus comprises means for generating a first signal for displaying a "ball" 14, means for generating a second signal for displaying a "net" 29, means for generating a third signal for displaying a "racket" 13, control means to change the direction of movement of the "ball" by controlling the coincidence between the "ball" 14 and the "racket" 13 control, means for changing the position of the "racket" 14 by means of a change of resistance of the control unit 3A, or other means, thereby changing the display on the TV screen by the action of the electronic control circuits. However, it is possible to input signals representing the position of "ball" 14, "racket" 13, etc. on the TV screen as digital signals and to display the change in the direction of movement of the "ball" 14 on the TV screen by electronic circuits including a counter. The apparatus is not limited in the application to general TV receivers for home use, but is applicable to TV sets for business use, such as those used at a game centre, in which case the apparatus is adapted to change the display of a game according to programs and information stored in a store by using a C.P.U. (central processing unit), a micro-computer, etc. and in response to the control of a control unit, thereby making it possible to carry out a complicated game of high standard. In other words, various improvements and modifications can be made to the apparatus described above by applying known electronic techniques regarding the television display.

As mentioned above, the above described apparatus is operable to control the movement of moving indicators on a TV screen in a TV gaming apparatus by the positional change of a movable element of an exercise equipment (turntable, sliding plate, etc.) and therefore a TV game using an exercise equipment may be played with more interest than in the case of a conventional TV game with no exercise equipment. Also, the apparatus is effective for making sporting goods whose use is rather monotonous more varied and interesting in appeal with a resultant improvement in the health of the players.

CLAIMS

1. Television gaming apparatus compris-

ing output means for connection to the antenna terminal of a television receiver via a game signal lead for displaying the progress of a game in response to the motion of a player on the screen of the television receiver, a control unit having a movable element which moves in response to the motion of a player, and an electric control element operable to vary an electric parameter in response to the positional change of said movable element, and a control lead having a pair of conductors connected to said electric control element, whereby the progress of a game to be displayed on the screen of the television receiver is varied according to the motion of a player.

2. Television gaming apparatus as claimed in claim 1, wherein the movable element is a rotatable turntable on which the player stands.

3. Television gaming apparatus as claimed in either one of claims 1 or 2 wherein the electric parameter is electric resistance and the electric control element is a variable resistor.

4. Television gaming apparatus as claimed in any one of claims 1 to 3, further including a control box provided with a connector in which is detachably fitted said control lead, in order to enable selective connection to either said control unit or an alternative control unit having a finger operated knob for varying said electric parameter.

5. Television gaming apparatus substantially as hereinbefore described with reference to Figs. 2 to 11 of the accompanying drawings.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd.—1980.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.